When stealing, go for millions? Quantitative analysis of white-collar crime sentencing in Poland.

Kazimierz Czarnocki and Dawid Janulek and Łukasz Olejnik

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Czarnocki Kazimierz (kazimierz.czarnocki@gmail.com),
Janulek Dawid (dawid.janulek@gmail.com),
Olejnik Łukasz (lukasz.olejnik93@gmail.com)

Abstract: The aim of this article is to analyse the length of custodial sentences for white-collar crimes in the context of Polish criminal policy. The analyses, based on the new and original data set obtained from case files, showed the non-linear dependency between the custodial sentence and the damage caused by a given fraud. From the perspective of the criminal law and economics, such a non-linearity may generate incentives for committing frauds on a bigger scale, because as the scale increases the relative severity of punishment decreases. Moreover, the gender bias in sentencing for the white-collar crimes in Poland was proven and in such cases women not only did receive lower custodial sentences, but also those ruled by female judges were lower.

Keywords: court decisions, white-collar crime, bias in sentencing
JEL Codes: K14, K40

The aim of this academic paper is to outline a potential ineffectiveness in Polish criminal policy caused by the existing non-linearity between the custodial sentence and the damage caused by the crime. One can notice flattening (concavity of a function) of penalties for frauds, because above a certain threshold, imprisonment penalties are only slightly dependent on the sum for which the convict has scammed his or her victims. Such a state of affairs raises important questions about the effectiveness of Polish criminal policy, because a lack of a close dependence between the penalty for a crime and the sum involved in the crime may generate stronger incentives to commit white-collar crimes involving high amounts of money. Inability to deter from committing a fraud may lead to an increase in the supply of crimes and in effect increase the severity of social harms caused by them. Such a relationship is grounded in the theory of economic analysis of law, where an agent decides to misbehave on the basis of the profit and loss account.

This article contributes to the literature, as it is one of the first empirical works in the scope of criminal law and economics which examines the dependence between the sum involved in a crime and the length of the sentence. A new and original dataset from court case files in Poland which were concluded with an imprisonment sentence for a fraud has been used. It has been demonstrated that courts issue relatively lenient sentences for financial frauds, and that there is a gender bias in sentencing.

1. Literature review and institutional background

Criminal law has been studied by economists for decades. In the ground-breaking work of Becker (1968), a decision to commit a crime is deemed a rational decision made based on a subjective assessment of costs and benefits of committing a crime. The foremost cost of committing a crime is the possible penalty (usually imprisonment), while benefits mainly include cash obtained as a result of the criminal activity, such as theft or financial fraud. The model proposed by Becker was then developed in consecutive works in the scope of criminal law and economics (in the works of, among others, Ehrlich 1973, Posner 1985, Levitt, Miles 2006, Polinsky, Shavell 2007). One of the conclusions is the discovery of a link between the expected imprisonment penalty and the supply of crimes. If detectability of crimes is low or if courts pass lenient sentences, crime rates increase.

Research also focuses on court decisions in terms of their bias and effect of characteristics of the accused on the sentence. Many works have demonstrated that the determinants of the length or degree of a sentence include the race of the accused (Alesina, La Ferrara 2014; Depew et al. 2017), their ethnicity (Gazal-Ayal, Sulitzeanu-Kenan 2010), sex of the accused (Steffensmeier, Demuth 2006), sex of the judge (Boyd, Epstein, Martin 2010) or age of the judge (Riger et al. 1995). In general, in the studies of the sentencing bias, three phenomena affecting the sentence can be distinguished: the judge effect, the court effect, and the accused effect (Johnson 2006). However, the literature lacks a study that would take into consideration the link between the sum involved in a crime and the length of the penalty.

One of the special categories of crimes is the so-called white-collar crime, which includes financial crimes such as fraud and deception, accounting crimes, collusion, tax fraud, credit fraud, and others. All those crimes are characterised by a lack of use of violence and a high sum involved. Studies show that white-collar criminals usually have a higher education degree, earn well, and enjoy a high social status (Benson, Moore 1992). White-collar criminals tend to have a broad understanding of law and tend to plan their frauds in advance. Moreover, they tend to have a consistent line of defence and rarely leave proofs of committed crimes. Altogether, such tendencies in a criminal's behaviour make it difficult to accuse them (Podgor 2007; Gottschalk 2014). The white-collar crimes suit well the theory of economic analysis of law cited above. Firstly, they are well prepared and planned in advance. Secondly, in their case the profit and loss account is easy to be done. So far, there have been few quantitative studies concerning the length of sentences for white-collar crimes, the main obstacle being a lack of data. The few studies include the works of Wheeler et al. (1982), Gottschalk (2011) and Bhattacharya, Marshall (2012).

This study uses a new and original dataset based on data obtained from a review of court case files. Files of all court cases from all criminal divisions of the Regional Court in Warsaw have been used. The studied period covers fraud cases from the period 2011–2016 concluded with a final conviction issued before the end of 2016. This study takes into consideration the original decisions of the Regional Court as well as decisions after consideration of potential appeals to the Court of Appeal and cassation to the Supreme Court. The study uses data from one Regional Court in order to avoid the above-mentioned court

effect. A person convicted for fraud is defined as a person convicted under Art. 286 in conjunction with Art. 294 of the Polish Criminal Code. Article 286 paragraph 1 of the Polish Criminal Code exhausts the definition of fraud as white-collar crime. Its wording is as follows:

Art. 286. § 1. *Whoever, in order to gain a material profit, causes another person to dispose of their property or someone else's property in a disadvantageous manner by misleading such person or by exploiting an error or incapability to duly understand the venture being undertaken shall be punishable by imprisonment from 6 months to 8 years.*

The data has been obtained under consent of the president of the Regional Court in Warsaw for viewing court case files in the archive under the supervision of an employee of the court. The sample includes all 107 persons who were sentenced by a final decision in 79 cases from the said period. All crimes were committed by persons residing in Warsaw. Sampling is one of exploring methods used for investigating sentencing decisions (Merall et al. 2010). The sample of 107 convicted persons may appear relatively small; however, access to court files is very difficult due to the protection of personal data and the presence of sensitive data; furthermore, court files in Poland are drawn up only in paper form. This makes the obtainment of data very cumbersome, if not impossible. One additional obstacle is the relatively small number of convictions for fraud under Art. 286 par. 1 of the Criminal Code, which forces the extension of the sample to a six-year period, from 2011 to 2016. In the studied period, there were no legal changes which would affect the manner of passing judgements and sentencing for fraud.

Court cases from the sample in question are quite diverse, although they all feature a relatively high amount of cash involved in the crime. Approximately 33% of the accused were convicted for credit frauds committed against banks; ca. 16% for accounting frauds and embezzlement against their own company; 12% for frauds in real estate trading. There were also some cases concerning the scamming of own clients, public institutions or casinos, forging documents and credit cards, and many other crimes. All those offences can be described as white-collar crimes due to the lack of violence and high sums involved; furthermore, a vast majority of the accused had a higher education and a high social status (ca. 15% of the accused were company owners or board members of large companies, 23% were lawyers, and 10% were CFOs or accountants). Despite the relatively high social status, the striking majority of defendants declared none or a little of wealth, that same holds for income (45% declared that they had no wealth, 65% declared that their income was lower than 2000 PLN per month). The most probable reason for such declarations was an attempt to foil bailiff execution.

It also needs to be noted that the aim of this article is not to assess the fairness of sentencing in legal, sociological and ethical aspect. The aim of this article is to show on the example of the Polish criminal system that the court judgments may generate incentives for

committing frauds on the larger scale. Thus, the criminal policy might not fulfil its role in deterring the potential criminal.

2. Model

The model is structured as follows:

$$y_i = \beta_0 + \beta_1 * crime_i + \beta_2 * Int_i * (crime_i - \theta) + \beta' X_i + \epsilon_i$$

where:
y_i — years of imprisonment
$crime_i$ — sum involved in the crime
$\beta_0,\ \beta_1,\ \beta$ – model parameters
θ – threshold value with an interaction variable
X_i – control variables
ϵ_i – residual

Whereas Int_i is a dummy variable, which assumes following values:

$$Int_i = \begin{cases} 1 & if\ crime_i \geq \theta \\ 0 & otherwise \end{cases}$$

The dependent variable in the study is the length of imprisonment to which the Regional Court sentenced the accused. The Polish penal system permits suspended imprisonment sentences. That is why in one of the equations of the model created as part of robustness check, the dependent variable is the length of a suspended imprisonment sentence. The subsequent robustness check equation contains potential changes to the sentence of the Regional Court made by the Court of Appeal (in 70 cases, the Court of Appeal upheld the decision, in 9 reduced the length of prison sentence, and it did not increase the sentence in any case). All those values are expressed in years. The use of the length of a sentence as a dependent variable is common in the literature (e.g. Wheeler et al. 1982).

The independent variable is the sum involved in the crime. Those values have been obtained from court case files, as in each verdict the court precisely determined the sum of money involved in a given crime. Regional Courts in Poland handle fraud cases which involve sums of money exceeding PLN 0.2 m (ca. EUR 47,951 at the exchange rate as at the end of 2017). Therefore, the lowest possible value is PLN 0.2 m, and the largest possible value is PLN 178 m. In total, out of 107 convictions, 36 concerned frauds for sums exceeding PLN 1 m (ca. EUR 239,693 at the exchange rate as at the end of 2017).

In order to demonstrate the non-linear dependence between the imprisonment sentence and the sum involved, an interaction variable has been created, assuming the value of the sum involved in a crime if it exceeds a certain threshold, and assuming 0 otherwise. Statistical significance of that interaction variable may indicate non-linearity, and the sign of the parameter may allow an assessment of its nature. The results contain estimations of the model parameter for three different thresholds.

It needs to be noted that the maximum length of a sentence for that crime is 8 years, which a priori conditions the non-linearity. In practice, however, the maximum length of a sentence in the studied sample was 7 years, and the average length of imprisonment was ca. 1.9 years. This indicates non-linearity of a different kind: one independent from the maximum sentence for the crime in question.

<Table 1> here

For the purpose of improving the quality of the model, the study uses a battery of control dummy variables, such as the age of the convict, sex of the judge, fact of repeat offending, number of committed frauds, and the fact of having a public defender (i.e. a court-appointed attorney at the expense of the state). In order to study the hypothesis about the significant effect of general prevention on the length of imprisonment penalty, police data concerning the number of frauds per a resident of Warsaw and data on detectability of fraudsters has been used. In order to verify the hypothesis about a possible gender bias in sentencing, all equations include three dummy variables whose value depends on the sex of the judge and of the accused person. The reference point is a situation where both the judge and the convict are men. In the sample, 107 sentences were issued by 31 judges — 15 women and 16 men. Among the convicts, there were 28 women and 79 men. Descriptive statistics are provided in Table 1, while the results of model estimation (with the use of OLS method) can be found in Table 2.

<Table 2> here

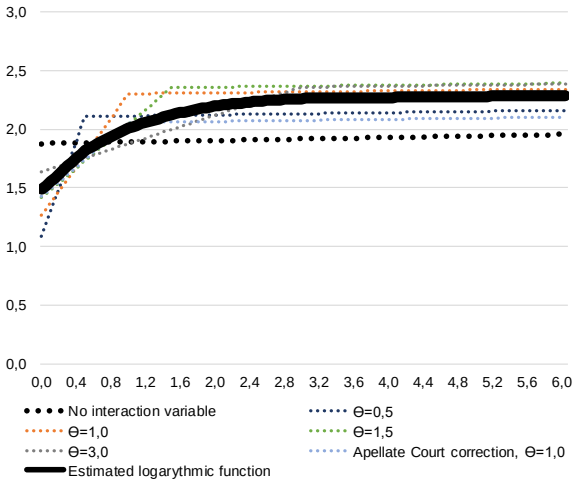
3. Results

The results of model estimation indicate a strong dependence between the sum involved in a crime and the length of prison sentence for that crime. The statistical significance and the sign of parameters with interaction variables confirm the existence of non-linearity: from a certain sum involved in a fraud, the penalty ceases to increase. The results of the test of parameter equality with a variable describing the sum involved in a crime and an interaction variable allow a positive verification of the hypothesis of their equality. Therefore, it can be concluded that above a certain threshold the sum involved in a crime has no effect on the degree of penalty for that crime. The estimated parameters of seven equations and an

estimation of the logarithmic function indicate flattening (concavity) of the function describing the dependences between the sum involved in a crime and the penalty for that crime (Graph 1). The maximum penalty for the crime in question is 8 years, which a priori conditions the non-linearity; however, non-linearity in the created model is of a completely different nature, because the issued penalties are considerably lower than the maximum one. From a certain sum, the slope of the function decreases almost to zero, and the average sentence of the Regional Court for fraud in excess of the threshold value θ is in almost each case in the interval between 2 and 2.5 years of prison. As part of a robustness check, also changes to the length of sentences issued by the Court of Appeal are included. After taking into account the commutation of verdicts, the slope decreases even further.

The presence of non-linearity is confirmed by a comparison of residuals of the model with the sum involved in a crime as an independent variable and residuals of the model with only control variables. Graph 2 presents a comparison between residuals of two models. Many points are located considerably far from the dotted line representing the lack of differences between residuals of the two models. Kernel-weighted local polynomial smoothing additionally demonstrates that the estimated function does not run in accordance with the dotted line representing the lack of differences between the residuals.

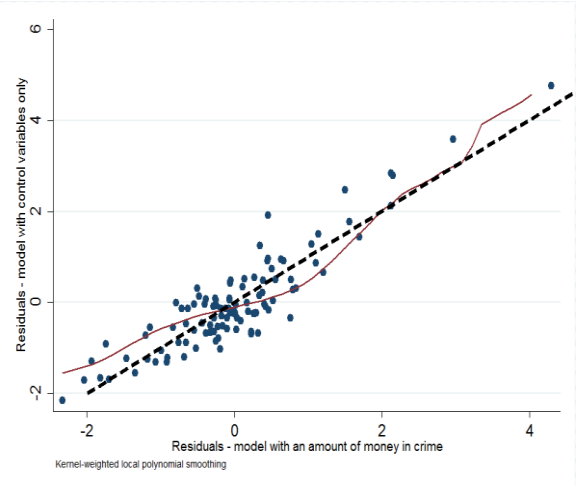
Figure 1. Dependence between imprisonment penalty and the sum involved in a crime



Source: own calculations

Note: The graph presents theoretical values of models with various threshold values depending on the sum involved in a crime (*crime*$_i$ variable). In the case of control variables, their average values have been applied.

Figure 2. Non-linearity between residuals of the model with and without the sum involved in a crime



Source: own calculations

The length of a prison sentence for fraud is also affected by the sex of the convict and the sex of the judge — convicted women receive shorter sentences, and female judges issue more lenient verdicts. This confirms the conclusions from above-mentioned studies of Riger et al. (1995), Steffensmeier, Demuth (2006), Boyd et al. (2010). It is worth noting that judges in Poland are assigned to cases by drawing lots. Thus, the gender bias is not caused by a

method of assigning judges to certain cases. However, one possible hypothesis is the existence of the latent variable, namely the attenuating circumstances (for example, women may plead guilty or try to repair damage more frequently than men do). The second possibility is that defendants may adjust their strategy depending on the judge's gender. Nonetheless, the precise reason for the gender bias is very hard to be investigated on the basis of quantitative method alone.

4. Conclusions

An analysis of the effect of the sum of fraud on the length of the penalty for that fraud allows a better understanding of white-collar crimes. A strong dependence between the length of a prison sentence and the sum involved has been demonstrated. The effect of the above-mentioned non-linearity is that repeating offences involving increasingly higher sums of money has no effect on the severity of the penalty. Since the penalty for a crime increases only slightly, potential white-collar criminals may feel stronger incentives to commit crimes involving higher sums of money. Such conclusions seem to be in line with the Polish folklore proverb "when stealing, go for millions," (which has a similar meaning to "go big or go home") because frauds involving higher sums are relatively more beneficial for the offender from the point of view of the severity of penalty for such crime.

Such a dependency decreases the effectiveness of country criminal policy because, as the economic law analysis states, low punishments (low cost of committing a fraud) go in pair with a higher supply of crimes. Mentioned nonlinear dependency between the custodial sentence and the damage caused by a given white-collar crime may be even more dangerous because not only it creates incentives for criminal activity, but also it encourages committing bigger frauds.

Furthermore, benefits from frauds are increased by mismanaged bailiff executions. The law states that the offender has to pay for the caused damage, but in reality it is not a case. The striking share of defendants have no wealth and income, so enforcement officers have no way to get the money back. In other words, the effective concealment of stolen assets increases the benefits of a crime, even if a custodial sentence is executed. The study has been conducted based on data from a Polish court, and the demonstration of a similar dependence and external validity in other countries would require further studies. However, the lack of an increasing rate of prison sentences for white-collar crimes committed for increasingly larger sums may be one of the reasons of supply of white-collar crimes also in other countries.

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Table 1. Descriptive statistics

Variables	Average	Min	First quartile	Median	Third quartiles	Max
Years of imprisonment (Regional Court sentence)	1,933	0,000	1,500	1,667	2,000	7,000
Years of imprisonment (Court of Appeal)	1,848	0,000	1,417	1,667	2,000	7,000
Years of suspended imprisonment (Regional Court sentence)	3,329	0,000	2,000	3,000	5,000	7,000
Sum of money involed in a crime (in millions PLN)	4,210	0,050	0,274	0,551	2,153	178,302
Sum of money involed in a crime above 0.5 m. (in millions PLN)	3,814	0,000	0,000	0,051	1,653	177,802
Sum of money involed in a crime above 1.0 m. (in millions PLN)	3,593	0,000	0,000	0,000	1,153	177,302
Sum of money involed in a crime above 1.5 m. (in millions PLN)	3,430	0,000	0,000	0,000	0,653	176,802
Sum of money involed in a crime above 3.0 m.(in millions PLN)	3,085	0,000	0,000	0,000	0,000	175,302
Number of commited frauds	6,477	1,0	1,0	1,0	2,0	155,0
Age of the convict	40,187	18,0	31,0	40,0	48,0	65,0
Female convict (n=28)	0,262	0,0	0,0	0,0	1,0	1,0
Female convict, female judge (n=15)	0,140	0,0	0,0	0,0	0,0	1,0
Male convict, female judge (n=38)	0,355	0,0	0,0	0,0	1,0	1,0
Female convict, male judge (n=13)	0,121	0,0	0,0	0,0	0,0	1,0
Male convict, male judge (n=41)	0,383	0,0	0,0	0,0	1,0	1,0
Public defender (n=36)	0,336	0,0	0,0	0,0	1,0	1,0
Repeat offending (n=9)	0,084	0,0	0,0	0,0	0,0	1,0
Member of the organised criminal group (n=11)	0,103	0,0	0,0	0,0	0,0	1,0
Detectability of fraudsters (in per	87,335	74,300	87,300	88,400	89,500	90,500
Crime rate per capita	0,003	0,001	0,002	0,003	0,004	0,005

Table 2. OLS estimation results

Independent variables	Dependent variable															
	Years of imprisonment (Regional Court sentence)		Years of imprisonment (Regional Court sentence)		Years of imprisonment (Regional Court sentence)		Years of imprisonment (Regional Court sentence)		Years of imprisonment (Regional Court sentence)		Years of imprisonment (Regional Court sentence)		Years of imprisonment (Court of Appeal sentence)		Years of suspended imprisonment	
	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error	Coeff.	Std. Error
Sum of money involed in a crime	0,0133**	0,0067	1,9714**	0,8769	1,0364***	0,3294	0,6369***	0,2090	0,2540**	0,1106	0,8959**	0,3503	0,6304**	0,2668	0,0323	0,4334
Sum of money involed in a crime above 0.5 m.	-	-	-1,9610**	0,8783	-	-	-	-	-	-	-	-	-	-	-	-
Sum of money involed in a crime above 1.0 m.	-	-	-	-	-1,0281***	0,3310	-	-	-	-	-0,8899**	0,3521	-0,6208**	0,2680	-0,0275	0,4355
Sum of money involed in a crime above 1.5 m.	-	-	-	-	-	-	-0,6286***	0,2106	-	-	-	-	-	-	-	-
Sum of money involed in a crime above 3.0 m.	-	-	-	-	-	-	-	-	-0,2457***	0,1127	-	-	-	-	-	-
Number of commited frauds	0,0242***	0,0059	0,0248***	0,0058	0,0246***	0,0057	0,0253***	0,0057	0,0250	0,0058	0,0242***	0,0065	0,0268***	0,0046	0,0187**	0,0074
Age of the convict	-0,0031	0,0106	-0,0064	0,0105	-0,0078	0,0103	-0,0069	0,0103	-0,0049	0,0105	-0,0092	0,0107	0,0037	0,0083	0,0026	0,0135
Public defender	-0,3000	0,2586	-0,2740	0,2536	-0,2442	0,2482	-0,2872	0,2485	-0,3077	0,2537	-0,3861	0,2554	-0,2932	0,2010	-0,5905*	0,3266
Skazany(a) jest recydywistą	-0,2134	0,4160	-0,3005	0,4094	-0,4031	0,4029	-0,4065	0,4049	-0,3924	0,4162	-0,5419	0,4438	-0,1844	0,3262	-1,3061**	0,5301
Member of the organised criminal group	-0,4612	0,4931	-0,3748	0,4846	-0,2726	0,4760	-0,3480	0,4753	-0,3458	0,4865	0,0784	0,6111	-0,2031	0,3854	-0,6000	0,6262
Detectability of fraudsters (in per cent)	-0,0075	0,0404	-0,0051	0,0396	-0,0157	0,0388	-0,0173	0,0390	-0,0156	0,0398	-0,0206	0,0390	0,0076	0,0314	-0,0212	0,0510
Crime rate per capita	124,93	136,78	170,52	135,55	149,38	131,19	137,41	131,49	125,36	134,16	64,67	140,05	142,43	106,23	-57,75	172,60
Female convict, female judge	-0,9977***	0,3560	-0,8884**	0,3522	-0,9015***	0,3422	-0,9724***	0,3421	-0,9913***	0,3492	-0,8519**	0,3553	-0,5111*	0,2771	-0,8073*	0,4502
Male convict, female judge	-0,5875**	0,2770	-0,4447	0,2788	-0,5261*	0,2659	-0,6145**	0,2663	-0,6559**	0,2735	-0,4870*	0,2864	-0,5434**	0,2153	-0,7192**	0,3498
Female convict, male judge	-0,9781***	0,3671	-0,9231**	0,3605	-0,9298***	0,3518	-0,9807***	0,3527	-0,9953***	0,3602	-1,0434***	0,3686	-0,4842*	0,2849	-0,6154	0,4629
2012	-	-	-	-	-	-	-	-	-	-	-0,9261**	0,4655	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-	-0,9365**	0,4588	-	-	-	-
2014	-	-	-	-	-	-	-	-	-	-	-0,6277	0,4355	-	-	-	-
2015	-	-	-	-	-	-	-	-	-	-	-0,5297	0,4267	-	-	-	-
2016	-	-	-	-	-	-	-	-	-	-	-1,2101**	0,5702	-	-	-	-
Constant	2,7614	3,8269	1,6927	3,7795	2,9076	3,6641	3,2614	3,6808	3,3084	3,7620	4,4486	3,6948	0,4692	2,9671	5,9075	4,8208
Number of observations (n)	107		107		107		107		107		107		107		107	
R-squared	0,2909		0,3266		0,3569		0,3523		0,3250		0,4020		0,4106		0,1655	
Wald test (p-value)	0,0003		0,0001		0,0000		0,0000		0,0001		0,0001		0,0000		0,1191	
Test (sum of money + interaction variable = 0) (p-value)	-		0,1357		0,2125		0,2162		0,2301		0,4113		0,0741		0,5857	
RESET test (p-value)	0,8129		0,6405		0,4795		0,3615		0,7635		0,0207		0,7510		0,2423	

Source: own calculations